Claims

The claims defining this invention are as follows:

1. A method for the electroless deposition of a desired metal layer on one or more selected portions of a substrate surface, wherein the method includes the steps of:
   - applying a masking layer onto the surface, said masking layer adapted to have one or more apertures formed therein so as to expose the one or more selected portions of the surface;
   - exposing the one or more selected portions of the surface to a colloidal suspension of catalytic particles adapted to adsorb to the substrate surface and to enhance deposition of the desired metal layer thereon; and
   - exposing the one or more selected portions of the surface to an ionic solution containing ions of the desired metal to enable formation of the metal layer.
2. A method according to claim 1, wherein the one or more apertures are formed in the masking layer after applying the layer to the substrate surface.
3. A method according to claim 1 or claim 2, wherein the substrate has a film of indium tin oxide (ITO) formed thereon.
4. A method according to claim 3 wherein at least some of the one or more apertures of the masking layer lie over one or more portions of the ITO film.
5. A method according to any one of claims 1 to 4, wherein the colloidal suspension includes particles of catalytic metal.
6. A method according to claim 5, wherein, when the substrate surface includes a film of ITO formed thereon, the catalytic metal and the material of the substrate are selected so that no substantial adsorption of the catalytic metal occurs on the substrate material.
7. A method according to claim 5 or claim 6, wherein the catalytic metal is palladium.
8. A method according to any one of claims 5 to 7, wherein the catalytic metal particles are polymer-stabilised.

9. A method according to claim 8, wherein the catalytic metal particles are stabilised with polyvinyl alcohol, poly(vinylpyrrolidoine) or a combination of these.

10. A method according to any one of claims 5 to 7, wherein the catalytic metal particles are stabilised with a solution containing tin ions.

11. A method according to any one of claims 6 to 10, wherein the substrate material is glass.

12. A method according to any one of claims 1 to 11, wherein the masking layer is formed of a polymeric material to which no substantial adherence of the catalytic particles occurs.

13. A method according to claim 12, wherein the polymeric material is selected from the group consisting of suitable polycarbonates, fluorinated polymers, cellophane, polyimide and acrylate-based polymers.

14. A method according to claim 12 or claim 13, wherein the polymeric material is a photoresist.

15. A method according to any one of claims 1 to 14, wherein the masking layer is formed of a dry film resist.

16. A method according to claim 15, wherein the dry film resist is selected from the group consisting of Asahi Chemical's Sunfort™ resists and DuPont's Riston™ resists.

17. A method according to any one of claims 12 to 16, wherein the one or more apertures in the masking layer are formed using UV lithography, a laser or screening means.

18. A method according to any one of claims 1 to 17 wherein, prior to the step of exposing the selected portions of the substrate to the colloidal solution, the layered substrate is cleaned to remove any residues of polymeric or organic material.

19. A method according to claim 18, wherein the cleaning is effected by plasma cleaning or UV ozone cleaning techniques.

20. A method according to any one of claims 1 to 19, wherein the step of exposing the one or more selected portions of the substrate to the colloidal solution is effected by dipping the substrate containing the masking layer into a bath of the colloidal solution.

21. A method according to any one of claims 1 to 20, wherein, after the step of exposing the one or more selected portions of the substrate to the colloidal solution, the selected portions are rinsed with de-ionised water.

22. A method according to claim 21 wherein, after the rinsing step, the selected portions are dried to remove substantially all of the water from the selected portions.

23. A method according to claim 22, wherein the drying step includes placing the layered substrate in an oven.

24. A method according to claim 22, wherein the drying step includes blowing a stream of gas over the layered substrate.

25. A method according to any one of claims 1 to 25, wherein the drying step includes both placing the layered substrate in an oven and blowing it with a stream of gas.

26. A method according to claim 24, wherein the step of exposing the one or more selected portions to the ionic solution is effected by dipping the substrate containing the masking layer into a bath of the ionic solution.

27. A method according to any one of claims 1 to 26 wherein, after formation of the metal layer, the masking layer is removed.

28. A method according to claim 27 wherein a strongly basic solution is used to facilitate removal of the masking layer.

29. A method according to any one of claims 1 to 25, wherein the masking layer is removed prior to the step of exposing the one or more selected portions to the ionic solution.

30. A method according to any one of claims 1 to 29, wherein the desired metal is selected from the group consisting of copper, nickel, chromium, molybdenum, tantalum and any alloy of these metals.

31. A method according to claim 30, wherein the desired metal is selected from copper and nickel.

32. A method for the electroless deposition of a desired metal layer on one or more selected portions of a substrate surface, substantially as herein before described with reference to any one or more of the drawings.

33. A product made according to the method of any one or more of claims 1 to 32.